

# Water Transmission & Distribution System Plan

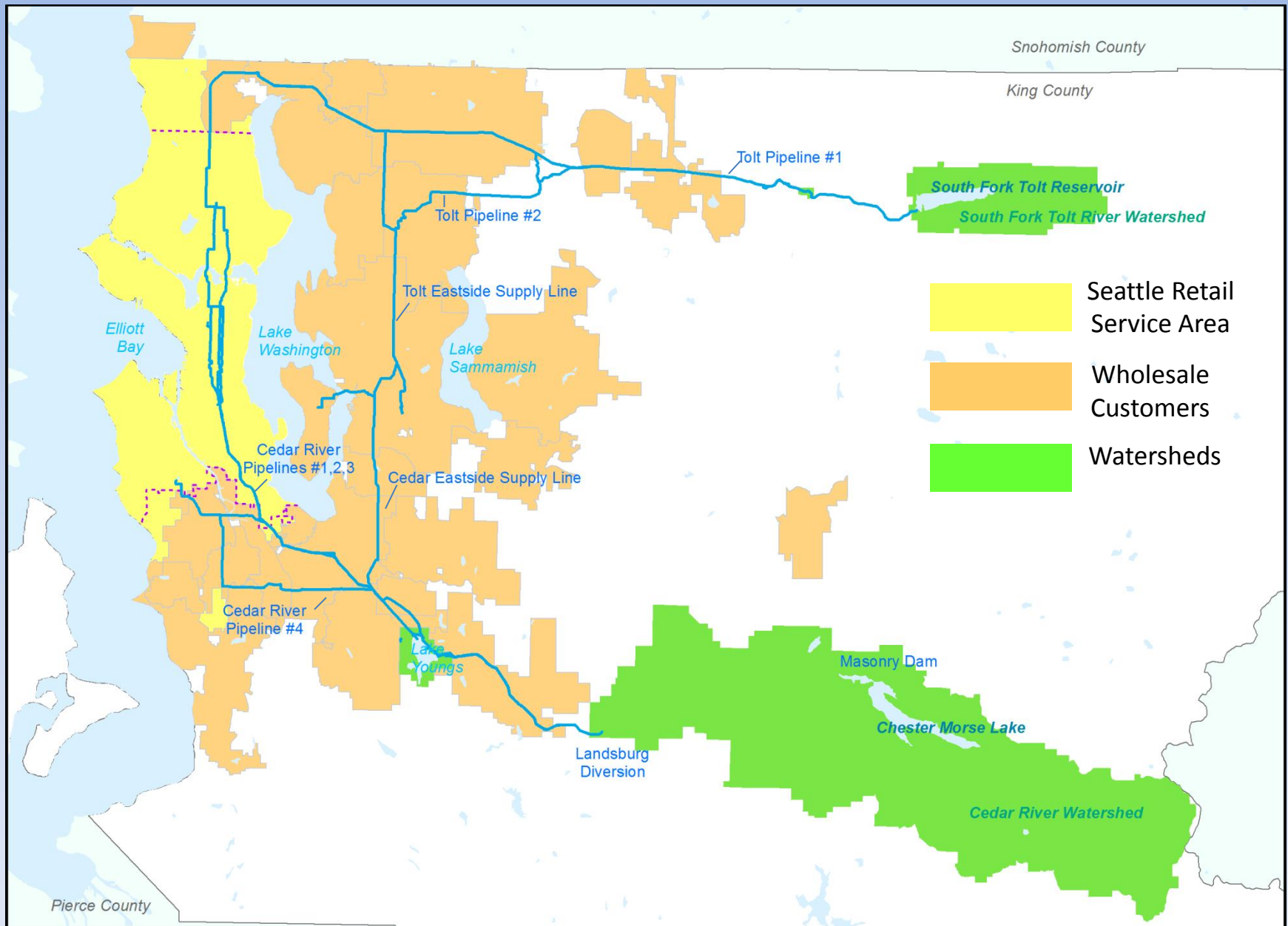
A Road Map for Addressing Key Issues in the Water Transmission & Distribution Systems & Guiding CIP and O&M Spending for the 2015 -2020 Rate Period....

Briefing for WSAC

April 21, 2014



# Seattle's Regional Water System



# Transmission & Distribution System Assets

The Combined T/D System includes the following assets:

- Approximately 1,800 miles of pipeline , including nearly 200 miles of transmission pipelines and over 1600 miles of distribution water main
- 400 million gallons of treated water storage in 13 covered reservoirs, and 12 elevated tanks and standpipes
- 31 pump stations
- 129 wholesale customer taps with meters
- 21,000+ distribution system valves
- 18,920 fire hydrants
- More than 188,000 retail service lines and meters.

# The overall goals of the plan include:

1. Address gaps in planning and policy that can improve consistency, quality and timeliness of decision making for the transmission & distribution systems
2. Develop system assessment tools, initiatives and programs to improve our ability to effectively manage water system assets
3. Develop well-thought-out 6 year CIP (2015-2020) for the Transmission & Distribution Systems that can Inform SPU's SBP / rate path.
4. Review O & M activities for the Transmission & Distribution Systems, identifying deficiencies, gaps or opportunities for efficiencies

# Trans & Dist Plan Organization

The plan is divided into several parts:

1. Planning & Policy, System Assessment Tools & Initiatives
2. Capital Improvement Program 6-Year
3. Review of FOM Branch O&M Programs

## Planning & Policy Development

- Seismic Reliability Planning & Program Development
- SODO Area Water Infrastructure Plan
- Water Main Replacement Program Refinement/ Long-term Strategy
- Asset Management Plans
- Tolt Pipeline Slide - Strategy



# SEATTLE AREA LIQUEFACTION AREAS

## Liquefaction

Very low

Very low to low

Low

Low to moderate

Moderate

Moderate to high

High

Water Line Features

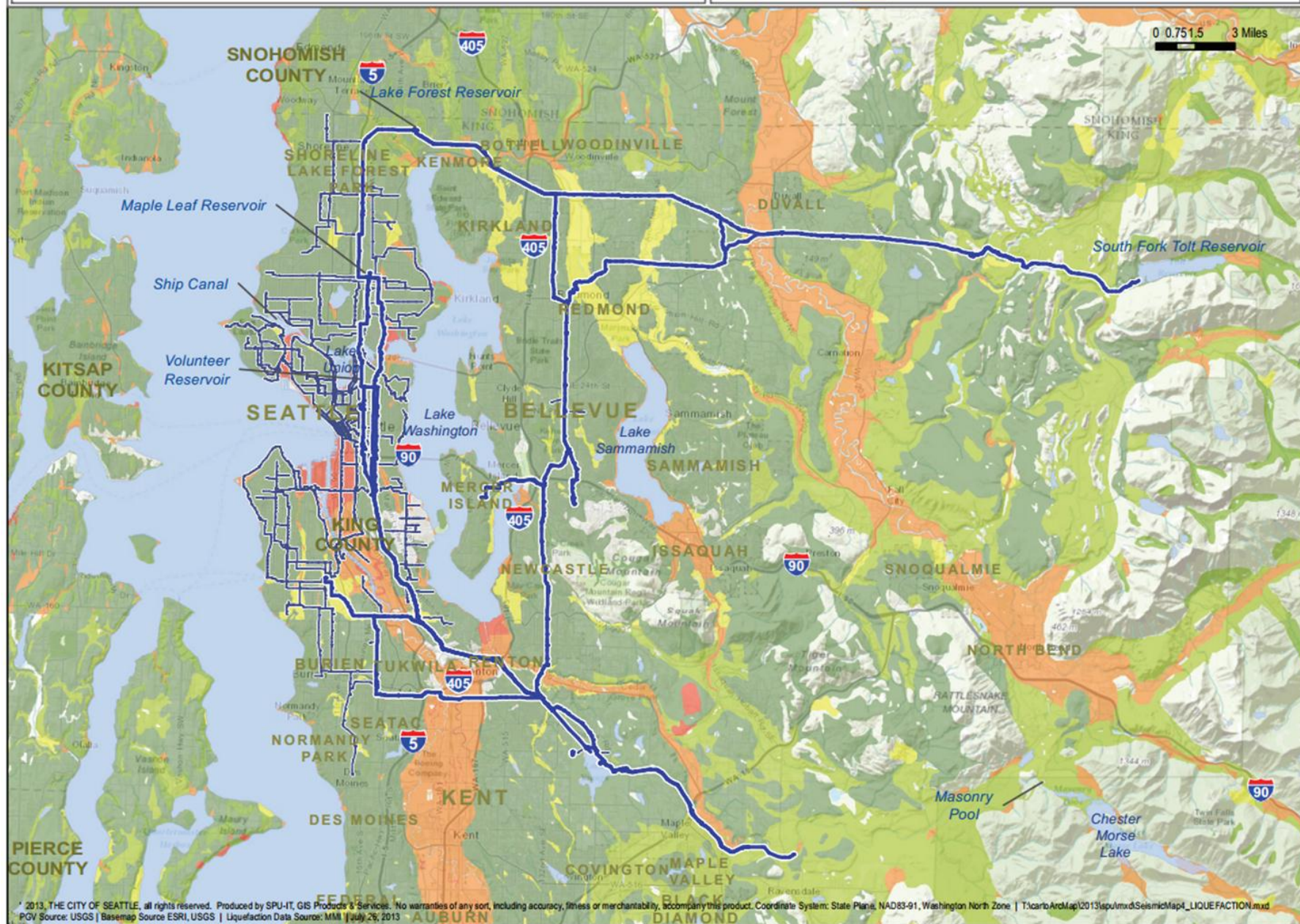
Feeder Main

Supply Line

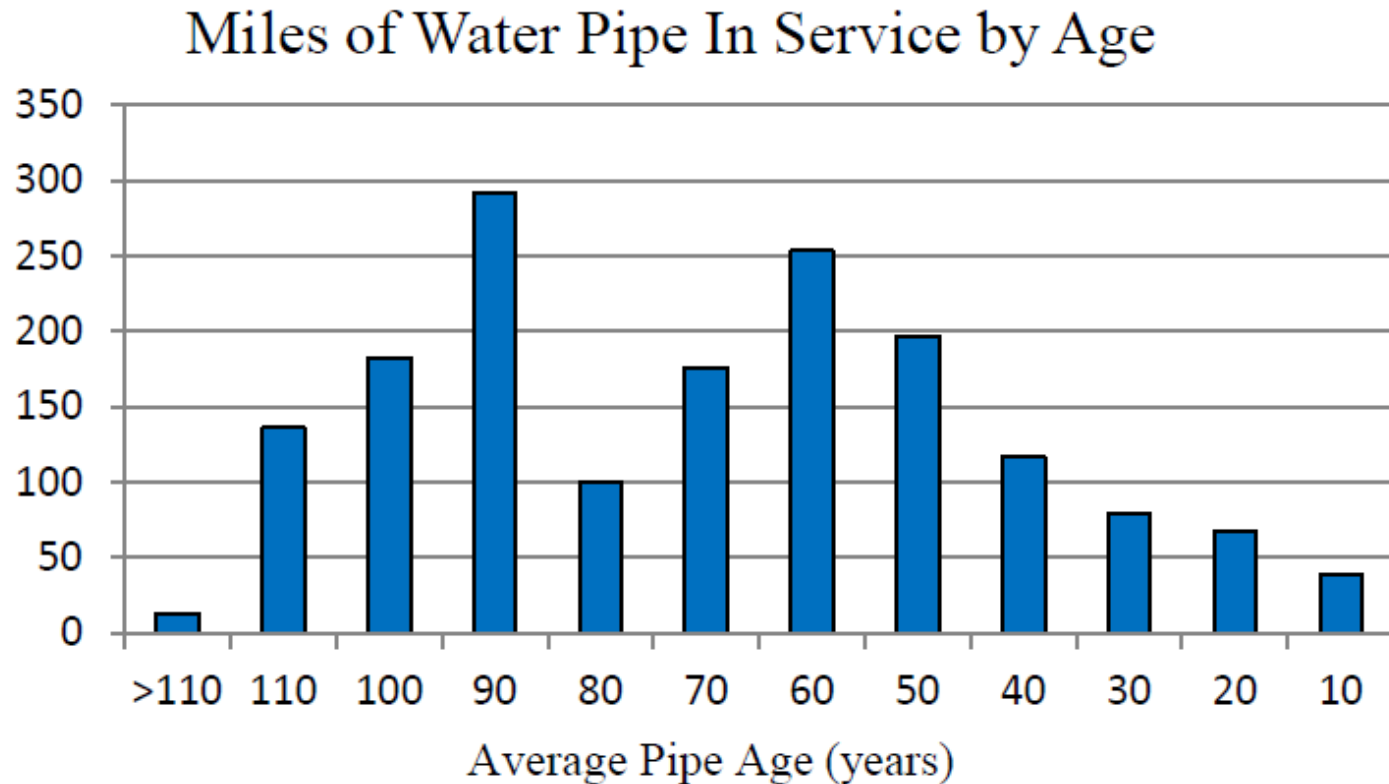
N



0 0.75 1.5 3 Miles

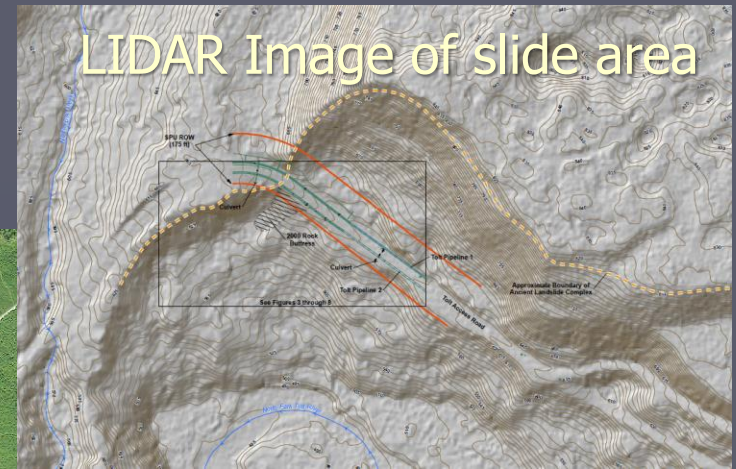


# Water Mains





# Tolt Slide Location



Slide impacting a stretch of the  
tolt pipelines  
Developing long-term plan for  
pipeline reliability and seismic risk



## **System Assessment Tools & Initiatives**

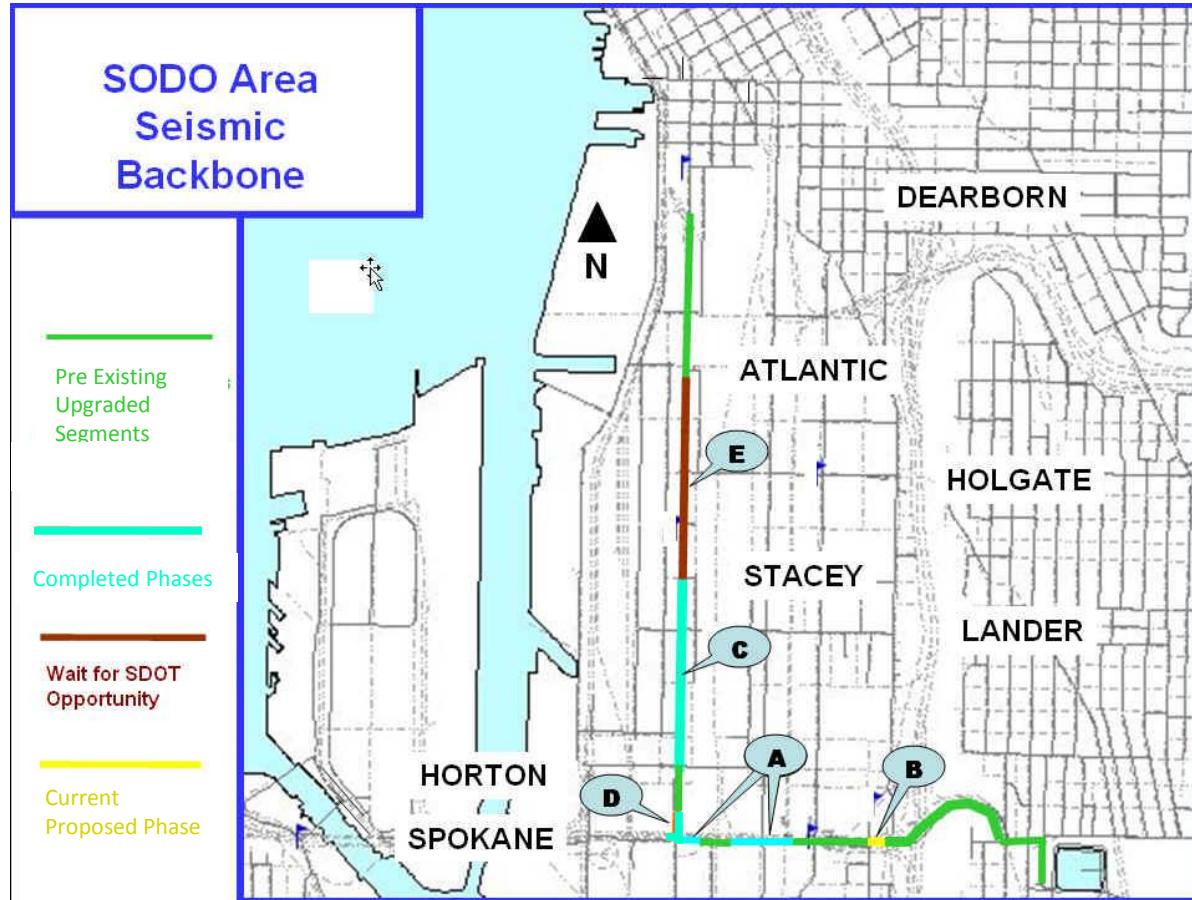
- **New Hydraulic Modeling Software Platform**
- **Pipeline Condition Assessment Program**
- **Distribution Pipeline Criticality**
- **High Impact Shutdown Blocks**
- **PS Energy Efficiency Study**
- **Asset Data Quality**

## 6 Year Capital Improvement Program

### Distribution System

- **Distribution program overall:** 6 yr funding at \$133.4M, roughly \$22M/ yr
- Highlights of program include
  - **Service Renewals (C1109)** - 6 yr funding at \$31.5M
  - **Distribution System Improvements (C1128)** - 6 yr funding at \$21.1M, Spending focused on:
    - ✓ Fire flow improvements – \$3.3 M scheduled for construction in 2015,
    - ✓ Pipeline seismic program - \$1.2M in 2015-16 for segment of seismic backbone
    - ✓ Reserve dollars for future fire flow, seismic, and other distribution improve opportunities

# SODO Area Seismic Backbone



- A. S Spokane St. from 1<sup>st</sup> Ave to 5<sup>th</sup> Ave
- B. S Spokane St. from 8<sup>th</sup> Ave to 9<sup>th</sup> Ave S, under I-5 exchange
- C. 1<sup>st</sup> Ave S from S Horton St to S Stacey St
- D. 1<sup>st</sup> Ave S & S Spokane St Intersection, plus 1<sup>st</sup> Ave S from S Spokane St extending approx. 400 ft. North
- E. 1<sup>st</sup> Ave S, from S Stacey St to S Atlantic St

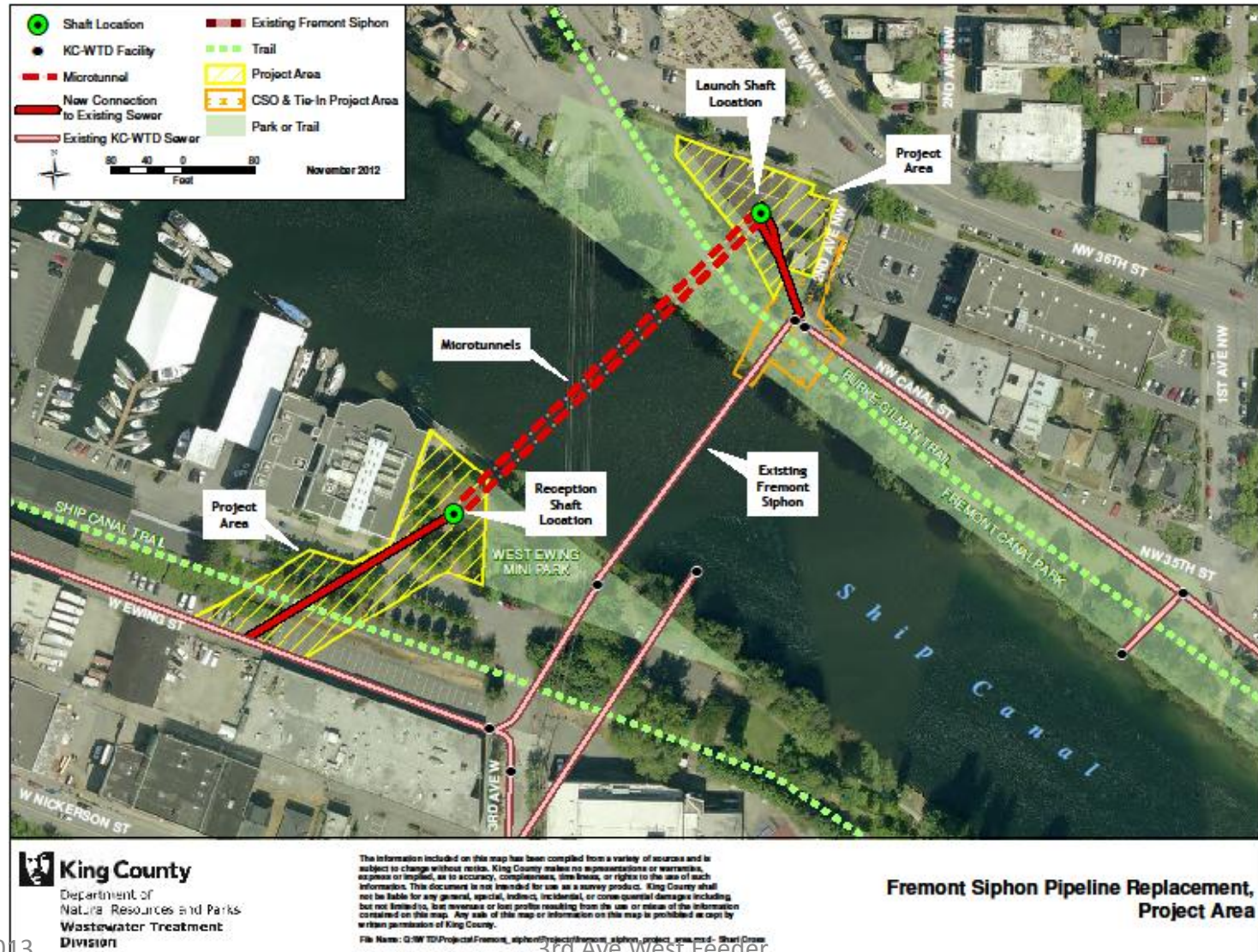
## 6 Year Capital Improvement Program

### Distribution System -continued

- **New Taps (C1113)** - 6 yr funding at \$38M
- **Pump Station Improvements (C1135)** 6 yr funding of \$3.4 M
- **Water Main Rehab program (C1129)** - 6 yr funding is at \$23M, Investments include:
  - ✓ SE Seattle WM Replacement - \$2.2M for construction in 2015
  - ✓ \$6.3 M for the 3<sup>rd</sup> Ave W feeder replacement construction in 2017-2018
  - ✓ 3 additional WM rehab projects of approx 1 mile each are proposed in 6 yr period

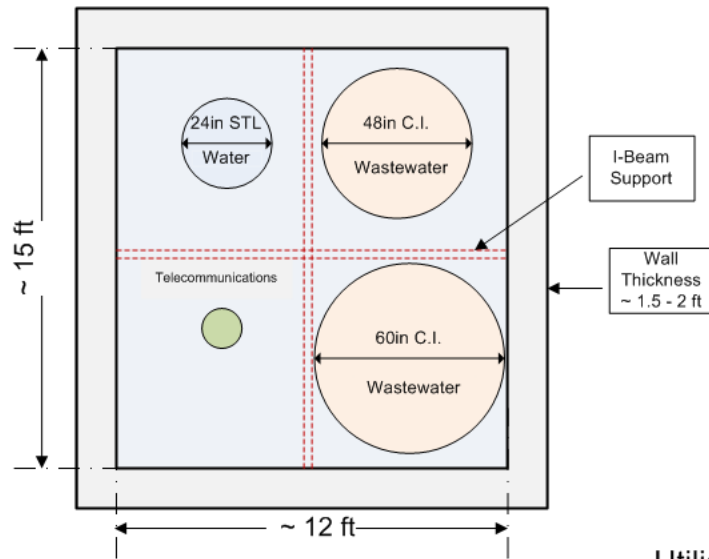


# 3<sup>rd</sup> Ave W feeder replacement

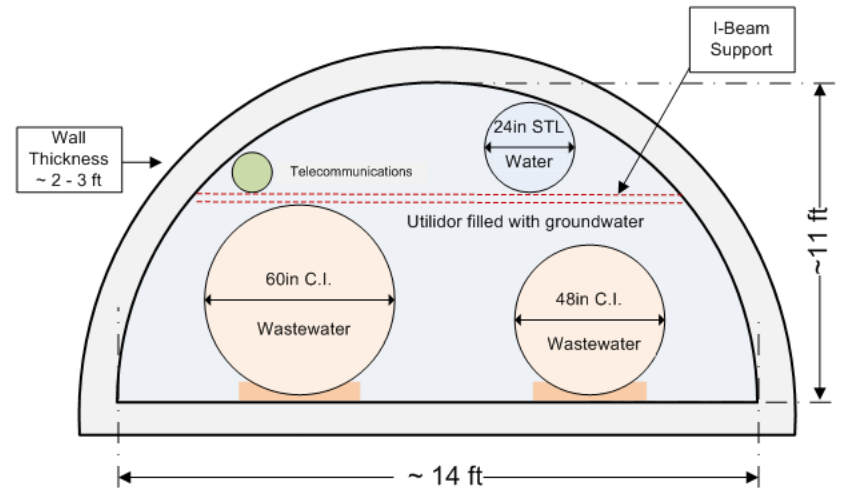


# 3<sup>rd</sup> Ave West Utilidor Existing Conditions (not to scale)

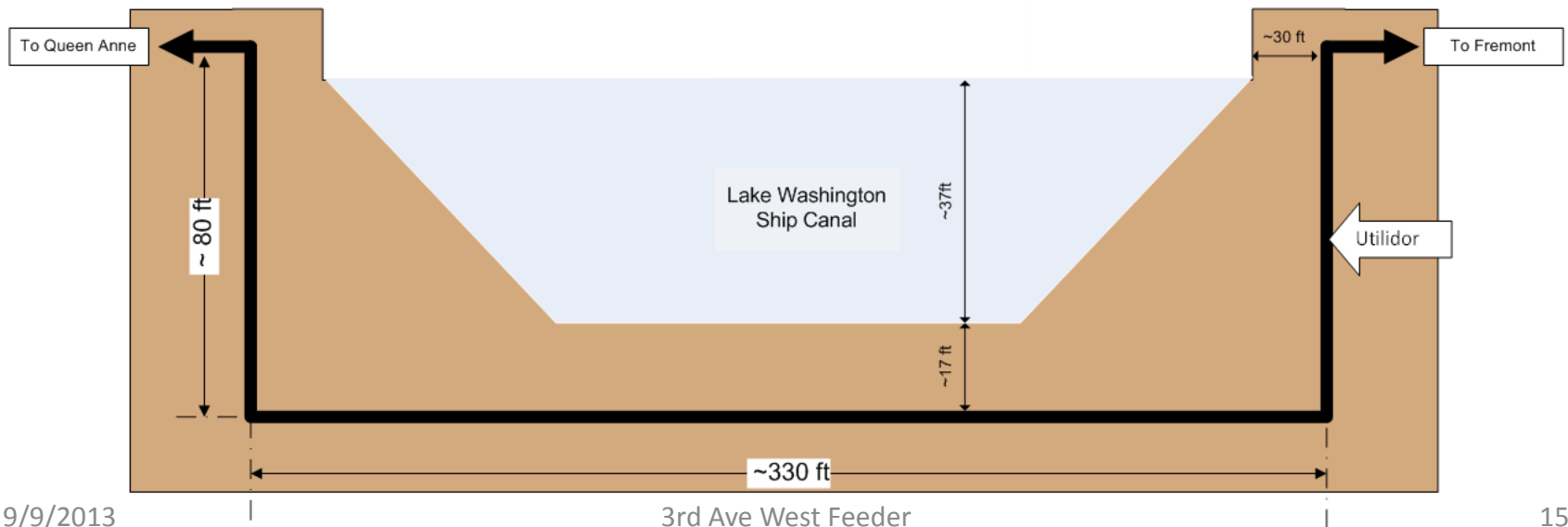
Plan View Vertical Shaft



Plan View Horizontal Segment



Utilidor Profile View



## 6 Year Capital Improvement Program

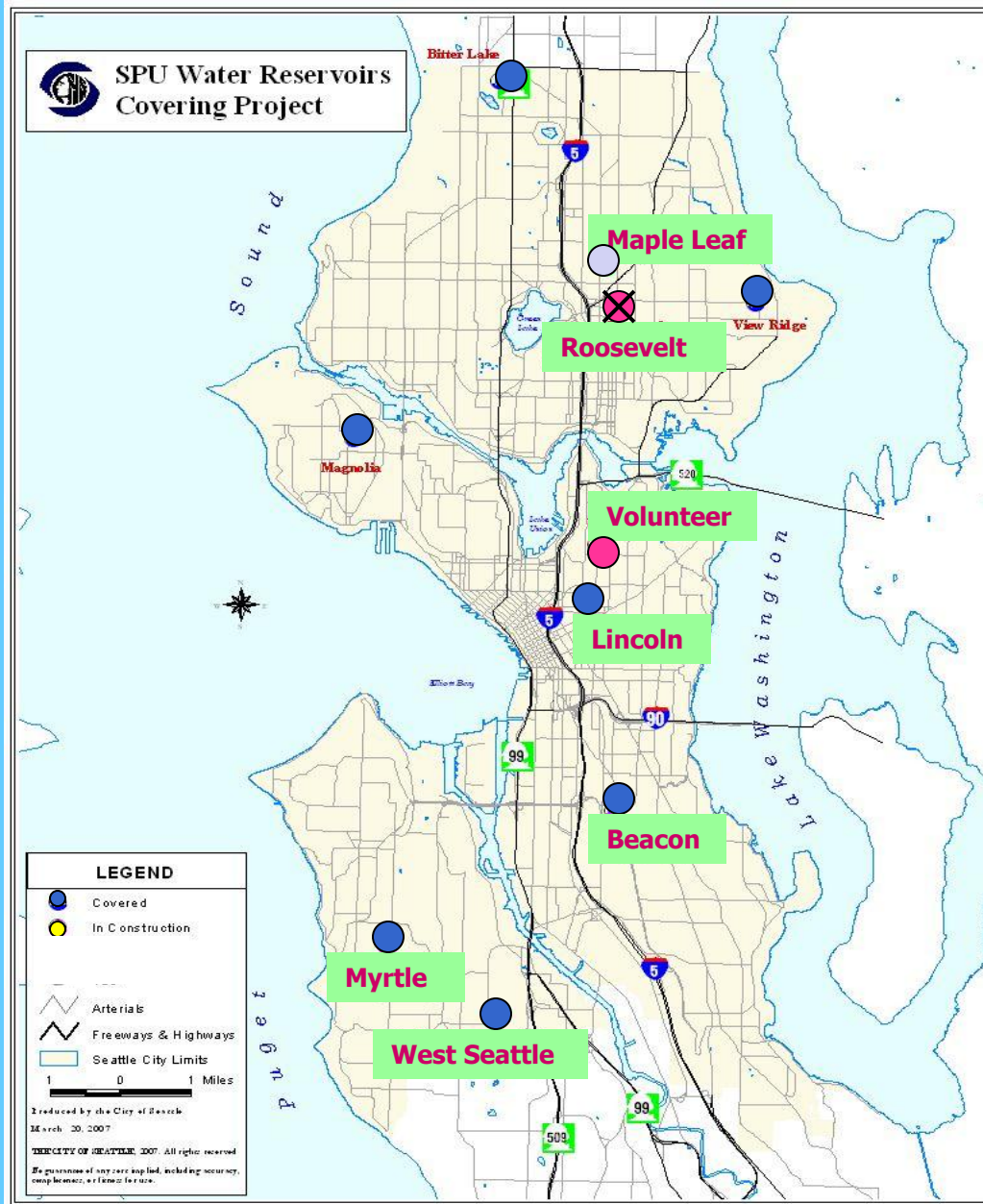


### Reservoir Program

- C1408 -C1411 Res Covering-at a 6 yr funding of \$20.2M
  - Reservoir Seismic retrofits (4)
  - Planning & design for Bitter Lake and Lake Forest Park Floating cover replacements in 2019-2020



# SPU Drinking Water Reservoirs



Reservoir	Status
Riverton	Covered (from start)
Eastside	Covered (from start)
View Ridge	Covered (from start)
Magnolia	Covered (1994)
Bitter Lake	Covered (floating / 2001)
Lake Forest Park	Covered (floating/ 2002)
Current Reservoir Covering Program	
Lincoln	Covered (2005)
Myrtle	Covered (2008)
Beacon	Covered (2009)
West Seattle	Covered (2010)
Maple Leaf	Covered (2012)
Roosevelt	In Test Decommissioning
Volunteer	In Test Decommissioning

Replace Covers

Retrofit



# Beacon Reservoir Construction



Aerial Photo of Beacon Reservoir Construction, October 2007



# Interior of Beacon Reservoir



## 6 Year Capital Improvement Program

### Transportation Related programs

- C4102-C4135 Transportation at 6 yr funding of \$33.5M,
  - ✓ \$6M planned for WM replacement triggered by SDOT's 23<sup>rd</sup> Ave Corridor project 2-15-2016
  - ✓ Placeholder dollars in 2017-2020 for future unknown /to be identified transportation project impacts and opportunities

# 23rd Avenue Corridor Improvements Project

## Phase 3

### Work Elements:

- Maintain 4 lane cross section
- Reconstruct pavement
- Sidewalk repair
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Lighting upgrade

## Phase 1

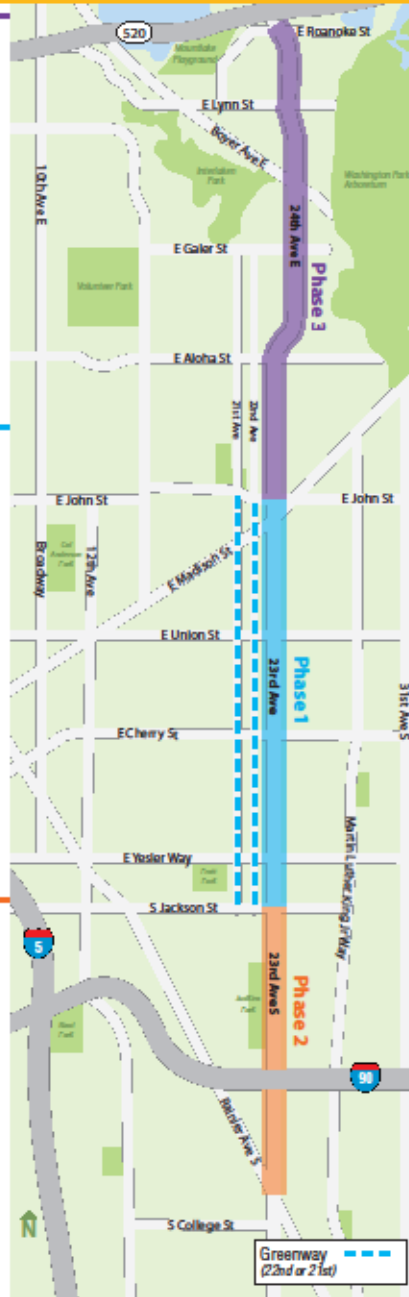
### Work Elements:

- New 3 lane cross section
- Expand sidewalks
- New landscaping
- Reconstruct pavement
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Install trolley poles
- Construct parallel greenway (separate project)
- Lighting upgrade

## Phase 2

### Work Elements:

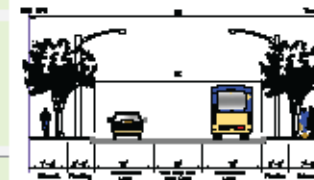
- New 3 lane cross section
- Expand sidewalks
- New landscaping
- Reconstruct pavement
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Install trolley poles
- Close Hill Street
- Lighting upgrade



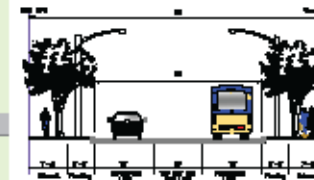
### Proposed Cross Section



### Proposed Cross Section



### Proposed Cross Section



## 6 Year Capital Improvement Program

### Transmission System

- **Transmission program Overall:** 6 yr funding \$15.6M
- Highlights of program include:
  - ✓ **Transmission PL Rehab (C1207)** - at a 6 yr funding of \$8.6 M  
Investments include:
    - \$2M in 2015-16 for 430 PL rehab in the vicinity and within the Lake Union Tunnel
    - Tolt pipeline slide mitigation - approx. \$1M/ yr. starting in 2016.
    - Currently exploring tunnel option to move pipeline away from slid hazard area
  - ✓ **Cathodic Protection (C12208)** – at a 6 yr funding of \$4.9 M:

## 6 Year Capital Improvement Program

### Overall Transmission & Distribution System CIP (6-YR)

- Distribution \$133.4M
  - Transmission \$15.6
  - Reservoirs \$22
  - Shared Cost/ Transportation \$33.5
- Overall \$202.8



## **Distribution O&M:**

- **Distribution System Valve O&M program:**
  - ✓ Most valve preventive maintenance work has been suspended for the last decade
  - ✓ Incidence of crews being unable to effectively shut down water mains using neglected line valves is up
  - ✓ Recommended programming 2 field crews (4FTE) to establish/restore a distribution system valve operations program
- **Hydrant maintenance:** Recommend restoring seasonal hydrant painting program at a ten-year painting cycle.

# QUESTIONS